

INVESTIGATIONS MATH



Our school district has adopted a new math series beginning with the 2013-14 school year. The series is: Investigations from the Pearson Education, Inc.

The curriculum is designed to:

- Support students to make sense of mathematics and learn that they can to be mathematical thinkers
- Focus on computational fluency with whole numbers as a major goal of the elementary grades
- Provide substantive work in important areas of mathematics—rational numbers, geometry, measurement, data, and early algebra—and connections among them
- Emphasize reasoning about mathematical ideas
- Communicate mathematics content and pedagogy to teachers
- Engage the range of learners in understanding mathematics.

The best thing about our new math series is that it is aligned to our Common Core State Standards.

An Overview of the math in Second Grade:

Number and Operations: Whole Numbers Students transition to thinking and working with groups, explore the composition of numbers to 100, and develop an understanding of the base-10 structure of our number system. The bulk of the work focuses on or supports the development of fluency with the operations of addition and subtraction. By the end of the year, students are expected to be fluent with the addition combinations to 10+10; to add 2 two-digit numbers accurately and efficiently; and to subtract two-digit numbers accurately.

Number and Operations: Fractions Students develop an understanding that fractions are equal parts of a whole, whether the whole is a single object or a set of objects. They work with halves, thirds, and fourths, including fractions greater than one, and learn what the numbers in fraction notation represent.

Geometry Students work with 2-D and 3-D shapes, with a particular focus on properties of rectangles and rectangular prisms. They are introduced to rectangular arrays (e.g. 2 rows of 3 squares), use them to find the area of rectangles, and develop an understanding of mirror symmetry. The optional *Shapes* software extends and deepens the work in each of these areas.

Patterns and Functions Students use tables to represent and explore situations with constant ratios (e.g. if 6 triangles cover a hexagon, how many triangles would cover 5 hexagons?). They also work with repeating patterns that provide an opportunity to think about odd and even numbers and what happens when you count by 3's starting at 1; starting at 2; starting at 3.

Data Analysis Students sort and classify objects and categorical data. They also work with numerical data, and see and use a variety of data representations including Venn diagrams, cubes towers, line plots, and student-created representations. They complete two data investigations and compare sets of data.

Measurement Students use direct comparison, indirect comparison, and linear units to measure and compare the lengths of different objects. They use nonstandard (e.g. cubes) and standard (e.g. inches, feet, centimeters) units of measure. Students also measure time as they practice naming, notating and telling time on digital and analog clocks. They use timelines to represent intervals of time and calculate elapsed time.

Ongoing Review and Practice

In Grade 2, 10-15 minutes per day is spent on one of four Classroom Routines. Students learn and practice how to name, notate, and tell time on digital and analog clocks in *What Time Is It?*. They generate and discuss different expressions that equal a given number in *Today's Number*. *Quick Images* provides practice with building mental pictures of visual images such as 2-D shapes or arrangements of squares or dots. In *How Many Pockets?*, the class estimates and then determines the number of pockets students are wearing every tenth day.

Over the course of second grade, students...

□ Visit “Sticker Station”—which sells single stickers, strips of 10, or sheets of 100—as a way to develop an understanding of the base 10 place value system.

- Use cubes, the number line, the 100 Chart, coins, and stickers to represent quantities, to solve problems, and to develop and refine strategies for adding and subtracting two-digit numbers.
- Use addition and subtraction to solve “Enough for the Class?” problems.
- Use “Partners and Teams” as a context for investigating what makes numbers even and odd, and what happens when you add even and odd numbers.
- Play games about adding up to and subtracting from 100, such as *Collect \$1.00* and *Spend \$1.00* and *Roll-a-Square* and *Unroll-a-Square*.
- Figure out how to use 2-D rectangles of various sizes to make a 3-D box or rectangular prism.
- Collect, represent, and analyze data about “favorite things”, the number of teeth students have lost, and the number of pockets the class is wearing every tenth day.
- Solve problems about equal groups and ratio like, “If a building has 3 floors, each with 5 rooms, how many rooms does it have?”.
- Investigate fractions of an area as they explore real flags and design their own.
- Solve problems about sharing an object or a set of objects among a given number of friends.
- Learn to tell time to the quarter hour – on both analog and digital clocks.
- Write a letter to the King’s carpenter and visit “The Land of Inch” as they learn about standard units of measure.
- Use stories about two traveling cats, Fred & Winnipeg, to explore timelines and duration.

Unit 1 – Counting, Coins, and Combinations

- Ten Cubes and Time
- Counting Cubes and Pattern Blocks
- The Number Line
- The 100 Chart
- Today’s Number
- Enough for the Class?
- Assessment: Counting Pennies
- Counting strips
- Collect 25¢
- How Many Pockets?

- Plus 1 or 2 Bingo
- Comparing Two Numbers
- Assessment: Enough for the Class?
- Make 10 and Quick Images
- Tens Go Fish
- Strategies for Finding Combinations of 10
- More Than Two to Make 10
- Addition Combinations
- Addition Story Problems
- Today's Number and Pocket Day
- A Subtraction Story Problem
- Solving Story Problems
- Introducing Doubling: the Magic Pot
- Games About Doubling
- Assessment: How Many Cans?
- End of Unit Assessment

Unit 2 – Shapes, Blocks, and Symmetry

- Subtraction Facts
- Geoblock Faces
- Working with Geoblocks
- Sorting Geoblocks
- Addition Combinations and Ways to Fill
- Combining Shapes
- Assessment: Sorting Shapes by Numbers of Sides
- Sorting Quadrilaterals
- Ordering Rectangles
- Building Rectangles
- Drawing Rectangles
- How Many Rectangles
- Assessment: Is it a Rectangle?
- Making Boxes from Rectangles
- Assessment: Faces of a Geoblock
- Symmetry

- Mirror Symmetry
- Copy Tiles
- Paper Folding and Cutting
- Is it Symmetrical?
- End of Unit Assessment

Unit 3: Stickers, Number Strings, and Story Problems

(Adding More Than Two Numbers)

- Does Order Matter?
- Number Strings
- Beat the Calculator
- Close to 20
- Addition Combinations Near Doubles
- Assessment Number Strings
- Revisiting Addition Story Problems
- Revisiting Subtraction Story Problems
- Related Story Problems
- Problems with Unknown Change
- Problems with Start Unknown
- Cover Up
- Story Problems
- Assessment: Story Problems
- Partners and Teams
- More Partners and Teams
- Assessment: Even or Odd?
- How Many Fingers in Our Class?
- Collect 50¢
- Counting by Groups
- More Counting by Groups
- Groups of 2, 5, and 10
- Tens and Ones
- Adding 10
- Sticker Problems
- Making Numbers with Tens and Ones

- End of Unit Assessment

Unit 4, Pockets, Teeth, and Favorite Things

(Working with Categorical Data)

- Guess My Rule with People
- Guess My Rule with Yekttis
- Guess My Rule with Two Rules
- Bar Graphs
- "Favorite Things"
- Organizing "Favorite Things" Data
- Sharing "Favorite Things" Data
- Assessment: Favorite Foods and Plus 10 Combinations
- Pocket Data Representations
- How Many Teeth Have You Lost?
- Collecting Teeth Data From Other Classes
- Comparing Teeth Data
- Mystery Teeth Data
- End-of-Unit Assessment

Unit 5, How Many Floors? How Many Rooms?

(Growing Patterns: Ratio and Equal Groups)

- How Many Floors? How Many Rooms?
- Using Tables to Record
- Comparing Tables
- Assessment: understanding Tables
- Ratio Relationships with Pattern Blocks
- Ratio Relationships with Pattern Blocks
- Cube Train Patterns
- Counting by 2's
- Counting by 3's
- How is Red-Blue-Brown-Green like Yellow-Black, White, and Orange?
- End-of-Unit Assessment

Unit 6 , How Many Tens? How Many Ones?

(Working with Tens and Ones)

- Story Problems with Stickers
- More Story Problems with Stickers
- Story Problems
- More Story Problems
- Working with 100
- Guess My Number on the 100 Chart
- Roll -a-Square
- Missing Numbers
- Sticker Books
- Strategies for Adding 2-Digit Numbers
- Strategies for Adding 2-Digit Numbers
- Assessment: How Many More?
- Adding to and Subtracting from 100
- Get to 100
- Collect \$1.00
- More Missing Numbers
- Unroll-a-Square
- Spend \$1.00
- Ten Tens
- Making 100 with Equal Groups
- How Many 5s in 100?
- Skip Counting by 2s, 5s, and 10s
- Assessment: Skip Counting Strips
- End-of-Unit Assessment
- Working with 3-Digit Numbers
- Numbers on the 200 Chart
- Stickers, How Many Hundreds, Tens, Ones?
- How Many Hundreds?
- Adding and Subtracting 10 and 100s
- Assessment to Hundreds, Tens, and Ones

Unit 7 – Parts of a Whole, Parts of a Group

- What is a half?
- Halves of Blocks and Balloon Bunches
- Halves of Blocks, Balloons, and Rectangles
- Halves of Rectangles and Sharing a Picnic Workshop
- Halves, Thirds, and Fourths
- Fourths of a Square
- Thirds of a Flag
- Parts of Circles
- More Fraction Flags
- Fraction Flag Posters
- Sharing Among Friends
- End-of-Unit Assessment

Unit 8 – Partners, Teams, and Paper Clips

- Adding Even and Odd Numbers
- Partners and Teams with Two Groups
- More Partners and Teams with Two Groups
- Adding Even and Odd Numbers
- More Adding Even and Odd Numbers
- Remaining Addition Combinations
- Plus 9 or 10 BINGO
- The Remaining Combinations
- Subtraction
- Pinching Paper Clips
- Subtracting in Parts
- Adding Up or Subtracting Back
- Story Problems
- Assessment: Paper Clips and Cherries
- Addition
- Strategies for Addition
- Keeping One Number Whole
- Adding Tens and Ones
- Adding 2-Digit Numbers

- End-of-Unit Assessment
- Adding and Subtracting 3-Digit Numbers
- Combining Stickers
- Adding Hundred, Tens, and Ones
- Subtracting Hundreds, Tens, and Ones
- Subtracting 3-Digit Numbers
- End-of-Unit Assessment

Unit 9 – Measuring Length and Time

(Different Units, Different Counts)

- Subtraction Facts
- Scavenger Hunt
- Scavenger Hunt Workshop
- Measuring with Different Units
- Measuring Jumps
- Comparing Jumps
- Assessment: A Measurement Disagreement
- Creating a Measuring Tool
- The Land of Inch
- Measuring with the Inch-Brick Tool
- A Map of the Land of Inch
- Two Measurement Systems
- Assessment: The King's Foot
- Rulers and Body Benchmarks
- Measurement Strategies
- Moving to Metric
- Metric Measurement
- End-of-Unit Assessment
- Representing Time
- A Timeline Tells a Story
- Hours of the Day and Night
- Fred and Winnipeg Timelines
- Solving Timeline Problems
- Special Day Timelines

- Comparing Special Day Timelines
- End-of-Unit Assessment